

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:

Seshadri *et al.*

Appl. No. 09/985,886

Filed: November 6, 2001

For: **Super-Orthogonal Space-Time
Trellis Codes, and Applications
Thereof**

Confirmation No. 4549

Art Unit: 2631

Examiner: (to be assigned)

Atty. Docket: 1875.1290002

Information Disclosure Statement

Commissioner for Patents
Washington, D.C. 20231

Sir:

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Listed on accompanying Form PTO-1449 are documents that may be considered material to the examination of this application, in compliance with the duty of disclosure requirements of 37 C.F.R. §§ 1.56, 1.97 and 1.98.

Where the publication date of a listed document does not provide a month of publication, the year of publication of the listed document is sufficiently earlier than the effective U.S. filing date and any foreign priority date so that the month of publication is not in issue. Applicants have listed publication dates on the attached PTO-1449 based on information presently available to the undersigned. However, the listed publication dates should not be construed as an admission that the information was actually published on the date indicated.

Applicants reserve the right to establish the patentability of the claimed invention over any of the information provided herewith, and/or to prove that this information may not

be prior art, and/or to prove that this information may not be enabling for the teachings purportedly offered.

This statement should not be construed as a representation that a search has been made, or that information more material to the examination of the present patent application does not exist. The Examiner is specifically requested not to rely solely on the material submitted herewith.

Applicants have checked the appropriate boxes below.

- ☒ 1. This Information Disclosure Statement is being filed within three months of the date of filing of a national application other than a continued prosecution application (CPA), OR within three months of the date of entry of the national stage as set forth in 37 C.F.R. § 1.491 in an international application, OR before the mailing date of a first Office Action on the merits OR before the mailing of a first Office Action after the filing of a request for continued examination under 37 C.F.R. § 1.114. No statement or fee is required.
- ☐ 2. This Information Disclosure Statement is being filed more than three months after the U.S. filing date AND after the mailing date of the first Office Action on the merits, but before the mailing date of a Final Rejection, or Notice of Allowance, or an action that otherwise closes prosecution in the application.
 - ☐ a. I hereby state that each item of information contained in this Information Disclosure Statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of this Information Disclosure Statement. 37 C.F.R. § 1.97(e)(1).
 - ☐ b. I hereby state that no item of information in this Information Disclosure Statement was cited in a communication from a foreign patent office in a counterpart foreign application and, to my knowledge after making reasonable inquiry, was known to any individual designated

in 37 C.F.R. § 1.56(c) more than three months prior to the filing of this Information Disclosure Statement. 37 C.F.R. § 1.97(e)(2).

- ☐ c. Attached is our Check No. _____ in the amount of \$ _____ in payment of the fee under 37 C.F.R. § 1.17(p).
- ☐ 3. This Information Disclosure Statement is being filed more than three months after the U.S. filing date and after the mailing date of a Final Rejection or Notice of Allowance, but before payment of the Issue Fee. Enclosed find our Check No. _____ in the amount of \$ _____ in payment of the fee under 37 C.F.R. § 1.17(p); in addition:
 - ☐ a. I hereby state that each item of information contained in this Information Disclosure Statement was cited in a communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of this Information Disclosure Statement. 37 C.F.R. § 1.97(e)(1).
 - ☐ b. I hereby state that no item of information in this Information Disclosure Statement was cited in a communication from a foreign patent office in a counterpart foreign application and, to my knowledge after making reasonable inquiry, was known to any individual designated in 37 C.F.R. § 1.56(c) more than three months prior to the filing of this Information Disclosure Statement. 37 C.F.R. § 1.97(e)(2).
- ☐ 4. The document(s) was/were cited in a search report by a foreign patent office in a counterpart foreign application. Submission of an English language version of the search report that indicates the degree of relevance found by the foreign office is provided in satisfaction of the requirement for a concise explanation of relevance. 1138 OG 37, 38.
- ☐ 5. A concise explanation of the relevance of the non-English language document(s) appears below:
- ☐ 6. Copies of the documents were cited by or submitted to the Office in an IDS that complies with 37 C.F.R. § 1.98(a)-(c) in Application No. _____, filed _____, which is relied upon for an earlier filing date under 35 U.S.C.

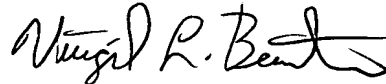
§ 120. Thus, copies of these documents are not attached. 37 C.F.R.
§ 1.98(d).

It is respectfully requested that the Examiner initial and return a copy of the enclosed PTO-1449, and indicate in the official file wrapper of this patent application that the documents have been considered.

The U.S. Patent and Trademark Office is hereby authorized to charge any fee deficiency, or credit any overpayment, to our Deposit Account No. 19-0036.

Respectfully submitted,

STERNE, KESSLER, GOLDSTEIN & FOX P.L.L.C.



Virgil L. Beaton
Attorney for Applicants
Registration No. 47,415

Date: June 10, 2002

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FORM PTO-1449 INFORMATION DISCLOSURE STATEMENT	ATTY. DOCKET NO. 1875.1290002	APPLICATION NO. 09/985,886
	APPLICANTS Seshadri et al.	
	FILING DATE November 6, 2001	GROUP 2631

U.S. PATENT DOCUMENTS							
EXAMINER INITIAL	DOCUMENT NUMBER	DATE	NAME	CLASS	SUB-CLASS	FILING DATE	
	AA1						
	AB1						
	AC1						
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FOREIGN PATENT DOCUMENTS							
EXAMINER INITIAL	DOCUMENT NUMBER	DATE	COUNTRY	CLASS	SUB-CLASS	TRANSLATION	
	AL1					Yes	No
	AM1					Yes	No
	AN1					Yes	No
	AO1					Yes	No
	AP1					Yes	No

OTHER (Including Author, Title, Date, Pertinent Pages, etc.)

AR	1	S. Alamouti, "A Simple Transmit Diversity Technique for Wireless Communications," <i>IEEE Journal on Selected Areas in Communications</i> , Vol. 16, No. 8, October 1998, pp. 1451-1458.
AS	1	Alamouti <i>et al.</i> , "Trellis-Coded Modulation and Transmit Diversity: Design Criteria and Performance Evaluation," <i>Proceedings of ICUPC</i> , IEEE, 1998, pp. 703-707.
AT	1	Divsalar <i>et al.</i> , "Multiple Trellis Coded Modulation (MTCM)," <i>IEEE Trans. Communications</i> , Vol. 36, No., 4, April 1988, pp. 410-419.

EXAMINER	DATE CONSIDERED
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EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to Applicant.

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U.S. PATENT DOCUMENTS							
EXAMINER INITIAL	DOCUMENT NUMBER	DATE	NAME	CLASS	SUB-CLASS	FILING DATE	
AA2							
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FOREIGN PATENT DOCUMENTS							
EXAMINER INITIAL	DOCUMENT NUMBER	DATE	COUNTRY	CLASS	SUB-CLASS	TRANSLATION	
AL2						Yes	No
AM2						Yes	No
AN2						Yes	No
A02						Yes	No
AP2						Yes	No

OTHER (Including Author, Title, Date, Pertinent Pages, etc.)			
AR	2	Fettweis <i>et al.</i> , "High-Rate Viterbi Processor: A Systolic Array Solution," <i>IEEE Journal on Selected Areas in Communications</i> , Vol. 8, No. 8, IEEE, October 1990, pp. 1520-1533.	
AS	2	Fettweis <i>et al.</i> , "Parallel Viterbi Algorithm Implementation: Breaking the ACS-Bottleneck," <i>IEEE Transactions on Communications</i> , Vol. 37, No. 8, IEEE, August 1989, pp. 785-789.	
AT	2	Forney, G., "The Viterbi Algorithm," <i>Proceedings of the IEEE</i> , Vol. 61, No. 3, March 1973, IEEE, New York, New York, pp. 268-278.	

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	AL3						Yes No
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	AN3						Yes No
	A03						Yes No
	AP3						Yes No

OTHER (Including Author, Title, Date, Pertinent Pages, etc.)

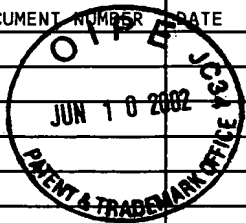
AR	3	H. Jafarkhani, "A Quasi-Orthogonal Space-Time Block Code," <i>IEEE Trans. Communications</i> , Vol. 49, No.1, January 2001, pp. 1-4.
AS	3	Siwamogsatham <i>et al.</i> , "Robust Space-Time Coding for Correlated Rayleigh Fading Channels," <i>Proceedings - Thirty-Eighth Annual Allerton Conference on Communication, Control, and Computing - Volume II</i> , University of Illinois, October 2000, pp. 1057-1066.
AT	3	G. Ungerboeck, "Channel Coding for Multilevel/Phase Signals," <i>IEEE Trans. Inform. Theory</i> , Vol. IT-28, No. 1, IEEE, New York, New York, January 1982, pp. 55-67.

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EXAMINER INITIAL		DOCUMENT NUMBER	DATE	NAME	CLASS	SUB-CLASS	FILING DATE
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	AL4						Yes No
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	AO4						Yes No
	AP4						Yes No

OTHER (Including Author, Title, Date, Pertinent Pages, etc.)

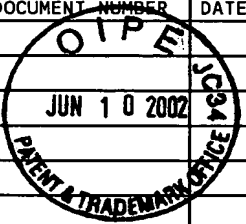
	AR	4	Tarokh <i>et al.</i> , "New Detection Schemes for Transmit Diversity with no Channel Estimation," <i>IEEE 1998 International Conference on Universal Personal Communications</i> , IEEE, Piscataway, New Jersey, 1998, pp. 917-920.
	AS	4	Tarokh <i>et al.</i> , "Space-time Block Codes from Orthogonal Designs," <i>IEEE Trans. Inform. Theory</i> , Vol. 45, No. 5, IEEE, July 1999, pp. 1456-1467.
	AT	4	Tarokh <i>et al.</i> , "Space-Time Block Coding for Wireless Communications: Performance Results," <i>IEEE Journal on Selected Areas in Communications</i> , Vol. 17, No. 3, IEEE, March 1999, pp. 451-460.

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	AA5						
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	AL5						Yes No
	AM5						Yes No
	AN5						Yes No
	A05						Yes No
	AP5						Yes No

OTHER (Including Author, Title, Date, Pertinent Pages, etc.)			
AR	<u>5</u>	Tarokh <i>et al.</i> , "Space-Time Codes for High Data Rate Wireless Communication: Performance Criterion and Code Construction," <i>IEEE Trans. Inform. Theory</i> , Vol. 44, No. 2, IEEE, March 1998, pp. 744-765.	
AS	<u>5</u>		
AT	<u>5</u>		

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